Research Summary

From a Semantic Significance to a Meaning

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This is a summary of our findings in Cognitive Science. We use a new approach in semantic structure modelling. That allows us to re-define several key concepts related to the fields of information science and cognition. Consequently, we were abble to implement our findings to solve challenging problems in Artificial intelligence and Communication.

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We define ***semantic significance*** as the distribution study of the different meanings related to a same word.
From a linguistic point of view, a meaning is a mutual link between the signified and a signifier.

With ***semantic significance,*** we can measure for each word the weight of its different meanings, depending on the Concept in which they are in use.

Thus, we consider any Concept as subsection of an Ontology ; we define a Language *(French, English, German etc ...)* as a ***Universal Ontology*** in natural language.
Consequently, any Concept that is described thanks to natural language words can be understood by a maximum number of individuals using that same Language.

Therefore we could understand the very nature of a Concept as a ***Semantic Likelihood*** function.
The ***Semantic Likelihood*** of a Concept depends on the ***Information Validity*** of its components words.

Information Validity is indeed an estimation of the «Noise / Signal» induced by a single word.

We've built a mathematical model for measuring the ***cognitive entropy*** of a lexical subgraph.

Given that cognitive processes are dynamic ; our ***cognitive entropy*** modelling happens to be a ***stochastic complexity*** calculus.

As a result, we've found that any Concept having a high Semantic Likelihood expresses an ***efficient information*** ; a maximal likelihood inducing maximum efficience.

Consequences :

1/ *Social Influence :* A maximal information efficience triggers decision making within a maximal number of individuals using a same Language.
# Application # : We can predict the impact of a public information on people's opinion.

2/ *Natural Language Processing :* Within every Concept, there is a word ***(W*)*** with a maximal Information Validity, so that the least *complex* way *(Kolmogorov complexity)* to describe or predict that Concept is to start from that ***(W*)*** word.
# Application # : Optimal prediction of intent triggering words for Chatbot building.